Catalogue of American Amphibians and Reptiles.

MARTOF, BERNARD S. 1975. *Pseudotriton montanus.*

Pseudotriton montanus Baird
Mud salamander

Pseudotriton montanus Baird, 1849:293. Type-locality (unconfirmed), "South Mountain, near Carlisle, (Cumberland County) Pennsylvania." Syntypes, U. S. Natl. Mus. 3839 (3), collected by Spencer F. Baird (not seen by author).
Spelerpes montana: Gray, 1850:45. New combination.
Pseudotriton flavissimus Hallowell, 1856:130. Type-locality "Liberty County, Georgia." Holotype, Acad. Nat. Sciences, Philadelphia 576, collected by J. E. LeConte.
Spelerpes ruber montanus: Cope, 1869:107. Reduced to a subspecies.
Geotriton rubra montanus: Garman, 1884:39. New combination.
Spelerpes ruber flavissimus: Cope, 1889:176. New combination.
Eurycea montana: Stejneger and Barbour, 1917:19. New combination.
Spelerpes montanus: Brimley, 1917:87. Emendation.
Eurycea montana flavissima: Loding, 1922:14. New combination.
Pseudotriton montanus montanus: Stejneger and Barbour, 1923:14. New combination.
Pseudotriton montanus flavissimus: Stejneger and Barbour, 1923:14. Emendation.
Pseudotriton montanus diastictus Bishop, 1941:14. Type-locality, "Cascade Cavern, Carter County, Kentucky." Holotype, S. C. Bishop Collection, number not given, collected by S. C. Bishop, present location unknown.
Pseudotriton montanus floridanus Netting and Goin, 1942:175. Type-locality, "Gainesville, Alachua County, Florida." Holotype, Carnegie Mus. 16850, collected by Archie F. Carr, Jr.
Pseudotriton flavissimus floridanus: Bishop, 1943:381. New combination.

• CONTENT. Four subspecies have been described (e.g. Conant, 1975), but I follow Bruce (1968) who questioned the geographic subdivisions and did not use trinomials.

• DEFINITION. A robust, short-tailed, brown-eyed, reddish or brownish salamander with discrete black spots. Adults range from 73 to 195 mm in total length. The tail constitutes about 36 to 44% of the total length. The dorsal ground color of coral pink, bright red or brownish salmon does not blend directly into the redness or yellowness of the lower sides and venter. The dorsal spots vary considerably but generally are small, round, few and well separated. Older adults tend to be darker; the dorsum varies from reddish brown to chocolate brown; the dorsal spots may be flecked or mottled with brown.

Hatchlings average about 10 mm in snout-vent length. The dorsal coloration of larvae is brown, sometimes with dark brown or black flecks or reticulations. Along the side of the body the reticulations may form longitudinal streaks. At metamorphosis the ground color changes from brown to rusty orange, the dark reticulations may be retained and the spotted pattern typical of adults may not develop until a year later. In some populations the larvae are spotted as are the adults. Larvae average about 36 mm in snout-vent length at the time of metamorphosis (Bruce, 1968) but range from 67 mm (Brimley, 1939) to 127 mm in total length (Wood, 1946).

• DIAGNOSIS. See Martof (1975a) for characteristics distinguishing *Pseudotriton* from other salamanders. *P. montanus* differs from *P. ruber* by having a brown iris, a shorter, more blunt snout, and the dorsal spots of older individuals tend to become obscure but do not fuse. In contrast, *P. ruber* is yellow-eyed, has a longer and less blunt snout, and its dorsal spots are irregular in shape and tend to fuse with increasing age. For other differences see Martof (1975b). The opercular apparatus of *P. montanus* differs from that of all other plethodontids (Monath, 1965).

The larvae of *P. montanus* are slender and uniformly light brown above with darker pigment in small irregular flecks scattered over the dorsal and lateral surfaces. The larvae of *P. ruber* are stouter, darker, distinctly mottled or streaked and usually without spots. Specific identification of hatchlings and small larvae is difficult.

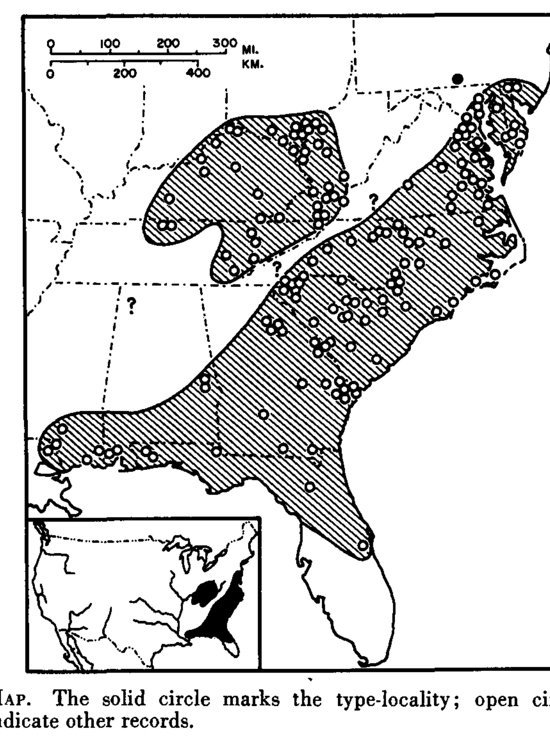
• DESCRIPTIONS. The best general accounts of all life-history stages are by Bishop (1943) and Bruce (1968, 1974, 1975). Other useful accounts include: Adults—Bishop (1941), Cope (1889), Dunn (1926), Mittleman and Gier (1948), and Nettling and Goin (1942); eggs—Brimley (1923, 1939), Dunn (1926), Fowler (1946), Goin (1947), and Wood and Witt (1962); larvae—Goin (1947), Netting and Goin (1942), and Wood (1946); opercular apparatus—Monath (1965); tongue and feeding—Regal (1966); skeleton—Hilton (1945, 1948).

• ILLUSTRATIONS. For illustrations in color see Barbour (1971) and Conant (1975). For black and white photographs of adults see Bishop (1941, 1943), Carr and Goin (1955), Huheey and Stupka (1967), Mittleman and Gier (1948, syntype), Netting and Goin (1942). Other illustrations include sketches of eggs and early larvae (Goin, 1947), dorsal outline of adult (Bishop, 1943), the opercular apparatus (Monath, 1965) and skeleton (Hilton, 1945).

• DISTRIBUTION. *Pseudotriton montanus* inhabits the Gulf Coastal Plain from the eastern tip of Louisiana to central Florida and northward in the Atlantic Coastal Plain and Piedmont of eastern Georgia, the Carolinas and Virginia, and in the Coastal Plain only of Maryland and southern New Jersey. The only specimens from Pennsylvania are the syntypes. West of the Appalachians, this species occurs in eastern Tennessee, Kentucky and western West Virginia and the western tip of Virginia. This species is primarily restricted to muddy springs, sluggish flood-plain brooks, and the swampy, forested areas along such streams. Transformed animals are seldom found submerged; usually they are beneath logs and stones, in decaying clumps of vegetation, or along the stream banks in burrows which often lead via a network of subteranean channels to water-filled chambers.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. For the most comprehensive studies of this species see Bruce (1968, 1969, 1974, 1975). Other important references include: Eggs—Brimley (1923, 1939), Dunn (1926), Fowler (1946), Goin (1947), Wood and Witt (1962); larvae—Wood (1946); courtship behavior—Robinson and Reichard (1965); critical thermal maximum—Hutchison (1961); responses to light, pH, and soil moisture—Batson (1965); opercular apparatus—Monath (1965); predators—Carr (1940); geographic variation—Bishop (1941, 1943), Neill (1948), Netting and Goin (1942); distributional records—Conant (1945, 1957), Fowler (1941), Hirschfeld and Collins



MAP. The solid circle marks the type-locality; open circles indicate other records.

(1963), Mittleman and Gier (1948), Seibert and Brandon (1960), Wright and Trapido (1940). Some early studies of "*ruber*" may actually refer to *montanus*; the two species were generally lumped prior to 1920.

• ETYMOLOGY. *Montanus* is derived from the Latin and means "of mountains" or "belonging to mountains." Apparently this epithet was chosen because this species was first discovered on South Mountain, Pennsylvania.

COMMENT

Knowledge of several aspects of the biology of this species is scant or absent: courtship behavior and comparison with that of *P. ruber*, date and site of oviposition, description of eggs and early embryology, parental care and survival of eggs, comprehensive study of geographic variation in life history and morphology including size, body proportions, ontogenetic changes and pigmentation.

LITERATURE CITED

Baird, Spencer F. 1849. Revision of the North American tailed-batrachia, with descriptions of new genera and species. J. Acad. Nat. Sci. Philadelphia 2(1):281–294.

Barbour, Roger W. 1971. Amphibians and reptiles of Kentucky. Univ. Kentucky Press, Lexington. x + 334 p.

Batson, Jackie D. 1965. Some comparative behaviour studies on three genera of salamanders. Trans. Kentucky Acad. Sci. 25:120–128.

Bishop, Sherman C. 1941. Notes on salamanders with descriptions of several new forms. Occ. Pap. Mus. Zool. Univ. Michigan (451):1–22.

— 1943. Handbook of salamanders. Comstock Publ. Co., Ithaca, New York. xiv + 555 p.

Brimley, Clement S. 1917. The two forms of red *Spelerpes* occurring at Raleigh, N. C. Proc. Biol. Soc. Washington 30(21):87–88.

— 1923. The dwarf salamander at Raleigh, N. C. Copeia (210):81–83.

— 1939. Reptiles and amphibians of North Carolina. Carolina Tips 2(5–6):19–22.

Bruce, Richard C. 1968. Life history studies of the salamanders of the genus *Pseudotriton* (Caudata: Plethodontidae). Ph.D. Thesis, Duke Univ. xii + 222 p.

— 1969. Fecundity in primitive plethodontid salamanders. Evolution 23(1):50–54.

— 1974. Larval development of the salamanders *Pseudotriton montanus* and *P. ruber*. Amer. Midland Natur. 92(1): 173–190.

— 1975. Reproductive biology of the mud salamander, *Pseudotriton montanus*, in Western North Carolina. Copeia 1975(1):129–137.

Carr, Archie F., Jr. 1940. A contribution to the herpetology of Florida. Tech. Publ. Univ. Florida 3(1):1–118.

—, and Coleman J. Goin. 1955. Guide to the reptiles, amphibians and fresh-water fishes of Florida. Univ. Florida Press, Gainesville, Florida. ix + 341 p.

Conant, Roger. 1945. An annotated check list of the amphibians and reptiles of the Del-Mar-Va Peninsula. Soc. Nat. Hist. Delaware, Wilmington, 8 p.

— 1957. The eastern mud salamander, *Pseudotriton montanus montanus*: a new state record for New Jersey. Copeia 1957 (2):152–153.

— 1975. A field guide to reptiles and amphibians of eastern and central North America. Second edition. Houghton Mifflin Co., Boston. xviii + 429 p.

Cope, Edward D. 1869. A review of the species of Plethodontidae and Desmognathidae. Proc. Acad. Nat. Sci. Philadelphia 21:93–118.

— 1889. The Batrachia of North America. Bull. U. S. Nat. Mus. (34):1–525.

Dunn, Emmett R. 1926. The salamanders of the family Plethodontidae. Smith College 50th Anniv. Publ., Northampton, Mass. viii + 441 p.

Fowler, James A. 1941. The occurrence of *Pseudotriton montanus montanus* in Maryland. Copeia 1941(3):181.

— 1946. The eggs of *Pseudotriton montanus montanus*. *Ibid.* 1946(2):105.

Garman, Samuel. 1884. The North American reptiles and batrachians. Bull. Essex Inst. 16:1–46.

Goin, Coleman J. 1947. Notes on the eggs and early larvae of three Florida salamanders. Nat. Hist. Miscellanea (10):1–4.

Gray, John E. 1850. Catalogue of the specimens of Amphibia in the collection of the British Museum. Part II. Batrachia Gradientia, London. 77 p., 4 pls.

Hallowell, Edward. 1856. Description of two new species of urodeles, from Georgia. Proc. Acad. Nat. Sci. Philadelphia 8:130–131.

Hilton, William A. 1945. The skeleton of *Pseudotriton.* J. Ent. Zool. 37(2):67–68.

— 1948. The vertebrae of salamanders. *Ibid.* 40(3):47–65.

Hirschfeld, Corson J., and Joseph T. Collins. 1963. Range extensions for three amphibians in north-central Kentucky. Copeia 1963(2):438–439.

Huheey, James E., and Arthur Stupka. 1967. Amphibians and reptiles of Great Smoky Mountains National Park. Univ. Tennessee Press, Knoxville. ix + 98 p.

Hutchison, Victor H. 1961. Critical thermal maxima in salamanders. Physiol. Zool. 34(2):92–125.

Loding, H. P. 1922. A preliminary catalogue of Alabama amphibians and reptiles. Geol. Surv. Alabama, Mus. Pap. (3):1–59.

Martof, Bernard S. 1975a. *Pseudotriton*. Cat. Amer. Amphib. Rept.: 165.1–165.2.

— 1975b. *Pseudotriton ruber*. *Ibid.*: 167.1–167.4.

Mittleman, Myron B., and Herschel T. Gier. 1948. American Caudata. III. The Status of *Pseudotriton montanus* in Ohio. Amer. Midland Natur. 40(2):372–377.

Monath, Thomas. 1965. The opercular apparatus of salamanders. J. Morphol. 116(2):149–170.

Neill, Wilfred T. 1948. Salamanders of the genus *Pseudotriton* from Georgia and South Carolina. Copeia 1948(2): 134–136.

Netting, M. Graham, and Coleman J. Goin. 1942. Descriptions of two new salamanders from peninsular Florida. Annals Carnegie Mus. 29(6):175–196.

Regal, Philip J. 1966. Feeding specializations and the classification of terrestrial salamanders. Evolution 20(3):392–407.

Robinson, Thane S., and K. Thomas Reichard. 1965. Notes on the breeding biology of the midland mud salamander, *Pseudotriton montanus diastictus*. J. Ohio Herpetol. Soc. 5(1):29.

Seibert, Henri C., and Ronald A. Brandon. 1960. The salamanders of southeastern Ohio. Ohio J. Sci. 60(5):291–303.

Stejneger, Leonhard, and Thomas Barbour. 1917. A check list of North American amphibians and reptiles. Harvard Univ. Press, Cambridge, Mass. iv + 125 p.

— 1923. A check list of North American amphibians and reptiles. 2nd. edition. Harvard University Press, Cambridge, Mass. x + 171 p.

Wood, John T. 1946. Measurements of a giant *Pseudotriton montanus montanus* larva from Great Smoky Mountains National Park. Copeia 1946(3):168.

—, and W. L. Witt. 1962. Herpetofauna collected by VHS members during first annual meeting at Camp Shawondasee, Chesterfield County, Virginia. Virginia Herpetol. Soc. Bull. (30):3–4.

Wright, Albert H., and Harold Trapido. 1940. *Pseudotriton montanus montanus* in West Virginia. Copeia 1940(2):133.

B. S. MARTOF, NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NORTH CAROLINA 27607.

Primary editor for this account, James D. Anderson.

Published October 22, 1975 by the SOCIETY FOR THE STUDY OF AMPHIBIANS AND REPTILES.